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PTO/SB/05 (4/98)
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UTILITY PATENT APPLICATION TRANSMITTAL <small>(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))</small>	Attorney Docket No.	BW-406
	First Inventor or Application Identifier	CANTRELL, D.
	Title	WRAPPER FOR SMOKING ARTICLE
	Express Mail Label No.	

EL406928770US

APPLICATION ELEMENTS <small>See MPEP chapter 600 concerning utility patent application contents.</small>	ADDRESS TO: Box Patent Application Washington, DC 20231
1. <input checked="" type="checkbox"/> * Fee Transmittal Form (e.g., PTO/SB/17) <small>(Submit an original and a duplicate for fee processing)</small> 2. <input checked="" type="checkbox"/> Specification [Total Pages 11] <small>(preferred arrangement set forth below)</small> - Descriptive title of the invention - Cross References to Related Applications - Statement Regarding Fed sponsored R & D - Reference to Microfiche Appendix - Background of the invention - Brief Summary of the invention - Brief Description of the Drawings (if filed) - Detailed Description - Claim(s) - Abstract of the Disclosure 3. <input type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets] 4. Oath or Declaration [Total Pages 3] a. <input checked="" type="checkbox"/> Newly executed (original or copy) b. <input type="checkbox"/> Copy from a prior application (37 C.F.R. § 1.63(d)) <small>(for continuation/divisional with Box 16 completed)</small> i. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).	5. <input type="checkbox"/> Microfiche Computer Program (Appendix) 6. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary) a. <input type="checkbox"/> Computer Readable Copy b. <input type="checkbox"/> Paper Copy (identical to computer copy) c. <input type="checkbox"/> Statement verifying identity of above copies
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7. <input checked="" type="checkbox"/> Assignment Papers (cover sheet & document(s)) 8. <input type="checkbox"/> 37 C.F.R. § 3.73(b) Statement <input checked="" type="checkbox"/> Power of Attorney <small>(when there is an assignee)</small> 9. <input type="checkbox"/> English Translation Document (if applicable) 10. <input type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449 <input type="checkbox"/> Copies of IDS Citations 11. <input type="checkbox"/> Preliminary Amendment 12. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) <small>(Should be specifically itemized)</small> 13. <input type="checkbox"/> * Small Entity Statement(s) <input type="checkbox"/> Statement filed in prior application, Status still proper and desired <small>(PTO/SB/09-12)</small> 14. <input type="checkbox"/> Certified Copy of Priority Document(s) <small>(if foreign priority is claimed)</small> 15. <input type="checkbox"/> Other:	

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES PATENT APPLICATION FOR

WRAPPER FOR SMOKING ARTICLE

BY

DANIEL V. CANTRELL

Variable	Mean	SD	Min	Max
Age (years)	27.1	4.8	18	38
Gender (male/female)	15/15	0	0	30
Occupation (student/worker)	15/15	0	0	30
Marital status (single/married)	25/5	0	0	30
Religious affiliation (Muslim/Hindu)	25/5	0	0	30
Education level (high school/university)	15/15	0	0	30
Income level (low/medium/high)	10/10/10	0	0	30
Health status (good/fair/poor)	20/10/0	0	0	30
Smoking status (smoker/non-smoker)	5/25	0	0	30
Alcohol consumption (yes/no)	5/25	0	0	30
Exercise frequency (regular/irregular)	10/20	0	0	30
Dietary habits (vegetarian/non-vegetarian)	15/15	0	0	30
Stress level (low/medium/high)	10/10/10	0	0	30
Sleep quality (good/fair/poor)	15/10/5	0	0	30
Mental health (stable/unstable)	20/10	0	0	30
Physical health (good/fair/poor)	20/10/0	0	0	30
Overall well-being (satisfied/dissatisfied)	15/15	0	0	30

WRAPPER FOR SMOKING ARTICLE
BY
DANIEL V.CANTRELL

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BACKGROUND OF THE INVENTION

10 The present invention is directed to a wrapper for a smoking article and particularly an inner wrap for a smoking article to reduce spotting.

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5 In the manufacturing of smoking articles, and particularly cigarettes, in the last few years there has been a considerable amount of detail paid to the wrappers for use in encasing a tobacco rod or other smokeable materials. There has been considerable concern for the reduction of secondary or sidestream smoke which is a by-product of the combustion of a smoking article as well as selected additives to reduce fire propensity which are formulated into the cigarette wrapper. Moreover, there have been suggestions of circumscribing tobacco rods with a plurality of wrappers wherein each wrapper has certain additives therein to reduce this sidestream smoke as well as fire propensity. However, in many cases the types of additives that have been added to
20 the cigarette wrapping papers have created off-taste or reduced the smoke quality or created undesirable appearances in the smoking article.

For example, U.S. Patent No. 4,225,636 and U.S. Patent No. 4,505,282 teach taste improvement in a smoking article by using a carbon inner liner in a smoking article. And, U.S. Patent No. 5,172,708 teaches an improvement in the yellow spotting

or staining with a double wrap cigarette paper wherein the inner wrap is comprised of a mixture of wood fibers, specifically pine and birch.

Spotting of the exterior wrapper on cigarettes occurs over time by either the tobacco pigment and/or flavor/casing additives transferring to the exterior layer of paper. Spotting is accelerated by transportation/storage temperatures above 90°F and high humidity. Temperatures of 120-130°F have been recorded during product transit from manufacturer to the final end market, especially during summer months.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a wrapper that eliminates spotting of the exterior paper wrapper during transportation/storage of the smoking article.

It is another object of the present invention to provide a double wrap smoking article wherein the inner wrap improves the taste quality of the smoking article and simultaneously reduces spotting or staining.

It is a further object of the present invention to provide an inner wrap for a smoking article wherein the inner wrap includes at least 50% by weight of wood fibers and less than 50% by weight of flax. Preferably, wood fibers would make up from 55 to 85% by weight of the inner wrap fiber matrix with the remainder being flax. It has been found that in manufacturing an inner wrap for the spotting/staining via a double wrap

smoking article that the lower the basis weight of the paper and the higher the porosity was desirable. For example, inner wrap papers having a basis weight of less than 15 gm/M² decreases irritation from smoke as the basis weight is lowered. Moreover, inner wrap papers having a basis weight of 12 gm/M² demonstrated a lower irritation than an inner wrap having a basis weight of 15 gm/M². And, inner wraps of a mixture of wood and flax where the fiber ratio was approximately 30% flax and 70% wood have been found to be better tasting with less smoke irritation in comparison with inner wraps comprised of a mixture of 50% abaca and 50% wood.

Double wrapped cigarettes using two conventional papers, made with flax or wood, or a combination of both fibers, having normal burn additives (0.3-2.5% citrates and 20-30% chalk), and normal porosity (10-120 Coresta) have been used in some products marketed in the past and are to some extent, still practiced today. The problem with using two layers of conventional papers is two-fold. First, the taste is negatively affected, by an increase in irritation, dryness, and overall papery character; and secondly, the smoke chemistry is changed by a substantial increase in mainstream vapor phase smoke components.

One of the unique characteristics of the inner wrap of the present invention is that it is made to have a porosity that would be normally associated with porous filter plug wraps (5,000 to 160,000 Coresta). The advantage of using a high porosity inner wrap is that much of the vapor phase components in the mainstream smoke are not elevated.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the preparation of smoking articles of the present invention, a double-wrap paper wrapper is wrapped around a tobacco rod wherein the outer wrap is a paper wrap which includes either 100% of flax fiber or 100% wood fiber or a mix of flax and wood fibers along with other additives, such as calcium carbonate, and is at a basis weight of about 20-25 gm/M² with a porosity in the neighborhood of 25-50 Coresta units with other additives which may include burn additives, and the like. The inner wrap is made up of from 55 to 85% percent, by weight, of wood fibers which includes soft wood, such as pine, and hard woods such as eucalyptus. Moreover, the inner wrap includes from about 15 to 45% by weight of flax. Preferably, the wood fiber is about 70% by weight and the flax is about 30% by weight. Generally, the flax is selected from the group consisting of bast flax fiber and shive flax fiber wherein the bast flax fiber is from 50 to 90% and the shive flax fibers is from 10 to 50%. Also, the inner wrap has a preferred basis weight of from 12 to 15 gm/M² and a porosity of from about 200 to 160,000 Coresta units. The two wrappers then circumscribe a tobacco rod wherein the tobacco rod may be prepared from burley, flue cured, oriental, reconstituted tobacco, stems, or any combination in order to obtain a smokable product.

The following examples are given to illustrate the present invention.

Examples 1-11

Smoking articles were prepared using a double wrap paper wrapper on a tobacco rod wherein the outer wrap is a paper wrap which includes 100% of flax fiber, 28% calcium carbonate, 25 gm/M² basis weight, 50 Coresta units and 0.6% mixed citrates of sodium and potassium. The tobacco rod is made up of 30% burley, 40% flue cured, 10% oriental, 15% reconstituted, and 5% stem. A description of the inner wrap formulations examined were:

- Examples 1-3 used approximately 50% abaca and 50% wood fibers, at basis weights of 16, 13 and 12 gm/M².
- Example 4 used approximately 1/3 wood, 1/3 abaca and 1/3 flax fibers at a basis weight of 13 gm/M².
- Examples 5-7 used approximately 40% abaca, 40% wood and 20% flax fibers, at basis weights of 14, 13, and 12 gm/M².
- Examples 8 and 9 used 100% wood fiber at basis weights of 13 and 12 gm/M².
- Example 10 used approximately 70% wood and 30% flax at a basis weight of 12 gm/M².
- Example 11 used the inner wrap of Example 10, but used a lighter weight (21 gm/M²) outer wrap.

In sensory testing, the different examples shown above, exhibited different smoking characteristics depending upon the basis weight of the inner wrap and the type of fiber(s) in the inner wrap. Example 11 clearly illustrates how a paper's basis weight affects the overall smoking properties. Table I sets forth some of the different smoking characteristics of the Examples.

TABLE I

EXAMPLE	INNER WRAP FIBER FORMULA	INNER WRAP BASIS WT. (gm/M ²)	SMOKE SENSORY PANEL RESULTS		
			<u>IRRITATION</u>	<u>SMOKE OFF-TASTE</u>	<u>QUALITY</u>
1	50 abaca/50 wood	15	8	8	Very poor
2	50 abaca/50 wood	13	6	8	Very poor
3	50 abaca/50 wood	12	5	8	Poor
4	33 abaca/33 wood/ 33 flax	13	4	6	FAIR
5	40 abaca/40 wood/ 20 flax	14	6	7	Poor
6	40 abaca/40 wood/ 20 flax	13	5	7	Poor
7	40 abaca/40 wood/ 20 flax	12	4	7	FAIR
8	100% wood	13	4	3	Good
9	100% wood	12	3	3	Good
10	70 wood/30 flax	12	2	2	Very good
11	70 wood/30 flax	12	1	0	Excellent

Key to Irritation and Off-Taste Ratings: (0=none, 1-3=low, 4-6=moderate, 7-9=high amount).

It can be seen from the above examples that Examples 1-7 show a strong negative correlation with abaca content and smoke quality, driven by off taste. There is

also a nice correlation with a reduction in irritation and improvement in smoke quality with lower basis weight of the inner wrap. Also, strongly correlated with better smoking properties are the use of standard cigarette paper fibers (wood and flax) as the fibers of choice for the inner wrap. Example 11 clearly demonstrates the combination of using the inner wrap of choice and a lower basis weight outer wrap.

It is to be understood that the invention is not to be limited to the specific Examples shown, as the parameter set forth in the Examples may be varied by appropriate changes or different levels of fibers used in the inner wrap.

What is Claimed is:

1. A smoking article comprising:

an outer wrap of a cellulosic fiber material
circumscribing an inner wrap comprising from 55 to 85% by
weight of wood fibers and from 15 to 45% by weight of flax,
said inner wrap circumscribing a tobacco rod.

2. The smoking article of Claim 1 wherein said wood fiber is about 70% by weight and said flax is about 30% by weight.

3. The smoking article of Claim 1 wherein said wood fiber is selected from the group consisting of soft woods and hard woods.

4. The smoking article of Claim 3, said soft wood being pine.

5. The smoking article of claim 3, said hard wood being eucalyptus.

6. The smoking article of Claim 1 wherein said flax is selected from the group consisting of 50-90% bast flax fibers and 10-50% shive flax fibers.

7. An inner wrap for a smoking article comprising:

from 50 to 85% by weight of wood and from 15 to
45% by weight of flax fibers.

8. The inner wrap of Claim 7 wherein said wood fiber is about 70% by weight and said flax is about 30% by weight.

9. The inner wrap of Claim 7 wherein said wood fiber is selected from the group consisting of soft wood and hard woods.

5 10. The inner wrap of Claim 7 wherein said flax is selected from the group consisting of 50-90% bast flax fiber and 10-50% shive flax fibers.

11. The inner wrap of Claim 7 wherein said inner wrap has a basis weight of from about 12 to 15 gm/M².

12. The inner wrap of Claim 11 wherein said inner wrap has a basis weight of about 12 gm/M².

13. The inner wrap of Claim 7 wherein said porosity is from about 200 to 160,000 Coresta units.

ABSTRACT OF THE DISCLOSURE

A smoking article particularly to eliminate spotting or staining and provide good smoke quality includes a double wrap smoking article which includes an outer wrap of a conventional cigarette paper and an inner wrap which is comprised of from about 55 to 85% wood fibers and 15 to 45% flax fibers, a basis weight of 12-15 gm/M² and a porosity of 200 to 160,000 Coresta or greater.

DECLARATION UNDER 37 C.F.R. 1.63 AND APPOINTMENT OF POWER OF ATTORNEY

As a below-named inventor, I hereby declare the following:

- My residence, post office address and citizenship are as stated below, next to my name.
- I believe that I am an original, first and sole or joint inventor (if more than one inventor is listed) of the subject matter which is claimed and for which a patent is sought on an invention entitled **WRAPPER FOR SMOKING ARTICLES**, the specification of which: (check one)

✓ is attached hereto.

was filed on

as Application Serial No.

and was amended on

- I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred-to above.

- I acknowledge my duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

- I hereby claim foreign priority benefits under Title 35, U.S.C. Sections 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

(Number)	(Country)	Filing Date (Day/Month/Year)	(Yes)	(No)
(Number)	(Country)	Filing Date (Day/Month/Year)	(Yes)	(No)

- I hereby claim domestic priority benefits under 35 USC §119(e) of any United States provisional Application(s) listed below:

Application Number

Filing Date

• I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or other PCT international filing date of this application:

U.S. Parent
Application or PCT
Parent Number

Parent Filing Date
Filing Date (Day/Month/Year)

Parent Patent Number
(if applicable)

_____	_____	_____
_____	_____	_____

• I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Section 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

• I hereby appoint James R. Higgins, Jr., Reg. No. 29,264, Charles G. Lamb, Reg. No. 24,783, John F. Salazar, Reg. No. 39,353, Jeffrey A. Haeberlin, Reg. No. 40,630 and Thomas B. McGurk, Reg. No. 44,920 as my attorneys, to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected therewith, and I request that all communications concerning this application be addressed to

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